or suggest that the analyzer 96 be ***independently portable with respect to the access control 97 and utilization means 99***. With each of the applications that Bowker describes for the Bowker invention, the whole system (analyzer, access control, and utilization means) is portable, but no teaching is found to make the analyzer 96 independently portable. With personal weaponry, Applicant respectfully submits that Bowker teaches that the analyzer 96 would be integral with the weapon, together with the access control 97 and utilization means 99. Applicant submits that the same would be true with the cellular phone and notebook computer applications. As to the public phone/ATM/vehicle-usage applications, Bowker fails to teach or suggest portability. Further still, Bowker fails to disclose teach or suggest the use of wireless communications between the portable key unit and the control unit to achieve locking/unlocking.

It is only after looking at the Bowker application through the lens provided by Applicant's invention that this passage in Bowker can be interpreted in the manner put forth by the Office Action. That is to say, only through ***impermissible hindsight*** can Bowker be interpreted as teaching that the analyzer 96 be independently portable with respect to the access control 97 and utilization means 99.

With the present invention, however, the key unit (comprising the sensor, the processor, and the semiconductor memory device) is portable independently of the control unit and the locking mechanism. That is even if the control unit and locking mechanism are implemented in a portable system, the key unit is independently portable with respect to the control unit and locking mechanism. Exemplary applications include independently portability via wireless data transmission techniques (see Application, pages 50-51). Independent portability and wireless communication between the portable key unit and the control unit provides greater freedom of movement for users of the claimed invention.

Therefore, Applicant respectfully submits that amended claims 12 and 31 (which recite independent portability of the key unit and wireless communication between the portable key unit and the control unit) are patentable over the Bowker/Tamori combination. Further, Applicant respectfully submits that dependent claims 13, 14, and 50-51 are similarly patentable. In particular, Applicant notes that the limitations found in dependent claims 13 (communication between the independently portable key unit and the control unit via magnetic coupling), 50 (IR communication between the independently portable key unit and

the control unit), and 51 (communication between the independently portable key unit and the control unit via electrostatic coupling) are not taught or suggested by the Bowker reference.

As to the Gullman reference which the Office Action has cited against claims 13 and 23, Applicant notes that the card embodiment depicted in Figure 3 of Gullman fails to disclose, teach or suggest wireless communication between the IC card and a control unit that controls locking/unlocking. Instead, Gullman teaches that a display 20 on the IC card 14' will output a "token" upon a positive biometric match being detected. The user of the IC card 14' then must enter this token through an access device coupled to the host system to gain access. Alternatively, Gullman teaches that the token can be communicated from the card to the host system "through a direct data communication line" (see Gullman, col. 2, lines 59-65) or a "standard data communication cable" (see Gullman, col. 4, lines 20-21). No specific reference can be found in Gullman that teaches the use of wireless communication between the portable key unit and the control unit. It is only through the use of impermissible hindsight, wherein Applicant's disclosed invention is used as a roadmap through the prior art, that wireless communication between a portable key unit and a control unit is found.

II. Claim 31 is nonobvious with respect to the Bowker/Tamori combination for the same reasons set forth in connection with claim 12; the Bowker/Tamori combination fails to teach or suggest a key unit with a because the Bowker/Tamori combination fails to teach a locking device with a switching device key unit comprising a sensor, a semiconductor memory device, and a processor, wherein the key unit is independently portable with respect to the switching device's starting switch, and wherein the portable key unit wirelessly communicates with the starting switch.

Claim 31 recites a switching device and includes limitations similar to those found in claim 12. Applicant respectfully submits that claim 31 is patentable over the Bowker/Tamori combination for the same reasons set forth in connection with claim 12. Further, Applicant submits that the claims depending from claim 31 (claims 23, 24, and 52-53) are also similarly patentable.

III. Claims 47 and 49 are nonobvious with respect to the Bowker/Tamori/Kinoshita combination because the Bowker/Tamori/Kinoshita combination fails to teach a locking device with a key unit comprising a processor for fingerprint data creation and registration but not a matching processor.

In rejecting claims 47 and 49 for obviousness, the Examiner cites the Kinoshita reference (JP 5233896) for teaching the separation of the first and second processors. The Office Action asserts that the "card control part 3" of Kinoshita is equivalent to the second processor and that the "management control section 11" of Kinoshita is equivalent to the first processor.

Applicant respectfully submits that the "card control part 3" of Kinoshita fails to disclose, teach, or suggest a processor that ***creates fingerprint data from the sensed fingerprint pattern*** and then registers the created fingerprint data. Rather, the "card control part 3" of Kinoshita appears to only control transmission of the characteristic information sensed by the fingerprint sensor 1 to a fingerprint storage device 2 (and then to a communication section 5).

Having failed to disclose, teach, or suggest a portable key unit with a processor for fingerprint data creation and registration, but not a matching processor, the Bowker/Tamori/Kinoshita reference fails to render claims 47 and 49 obvious.

IV. Claims 46 and 48 are nonobvious with respect to the Bowker/Tamori/Kinoshita combination because the Bowker/Tamori/Kinoshita combination fails to teach a locking device with a key unit comprising a matching processor but not a processor for fingerprint data creation and registration.

In rejecting claims 46 and 48 for obviousness, the Examiner cites the Kinoshita reference (JP 5233896) for teaching the separation of the first and second processors. The Examiner further cites to Bowker for teaching the use of a portable key unit with a matching processor, but not a registration processor. (See Office Action, page 18).

However, Applicant respectfully submits that the Bowker reference fails to teach separation of the matching processor and the fingerprint data creation/registration processor, wherein the portable key unit includes the matching processor but not the fingerprint data creation/registration processor. The passage cited in Bowker appears silent with respect to the placement of the fingerprint creation/registration processor.

Further, the Bowker/Tamori/Kinoshita combination fails to render claims 46 and 48 obvious for the same reasons set forth in Section I.

Therefore, Applicant respectfully submits that the obviousness rejection of claims 46 and 48 are improper and should be withdrawn.

V. Claims 17 and 21 are nonobvious with respect to the Bowker/Tamori/Katsumi Nagaki combination because the Bowker/Tamori/Katsumi Nagaki combination fails to teach a portable key unit comprising a sensor and a processor, but not a semiconductor memory device.

In rejecting claims 17 and 21 for obviousness, the Examiner contends that the Bowker/Tamori combination teaches all limitations of claims 17 and 22 except for the specific distribution of components recited in claims 17 and 21. The Office Action cites the Katsumi Nagaki reference (JP 7-14048) for teaching this missing limitation when it states:

> Katsumi discloses an electric locking device that locks and unlocks a lock by an installed circuit for personal data of a key owner and by analyzing the data by use of a judging circuit in the lock. Key (portable device) 1 comprises fingerprint image input circuit 6 (CCD element, i.e. sensor) (Fig. 2). The lock comprises a digital controller, a judging circuit connected to the digital controller, data memory and unlocking device for the lock. The judging circuit (matching processor) compares the user's fingerprint with registered data in the data memory, and if it matches the preregistered data, it sends the unlock signal to the unlocking device of the lock (see Fig. 3). *Besides the aforementioned embodiment example, a judging circuit (matching processor) **may** be built in key 1 (i.e., the key has only a sensor and matching processor).* (See Office Action, page 19) (emphasis added).

Applicant notes that no citation is given in the above-quoted paragraph to support the assertion that Katsumi Nagaki teaches placement of the judging circuit and the input circuit within the portable key. Therefore, Applicant respectfully submits that the Office Action fails to set forth a sustainable obviousness rejection of claims 17 and 21. Withdrawal of the rejection is respectfully requested.

VI. Claims 43 and 44 are nonobvious with respect to the Bowker/Tamori/Sasaki Mitsuyuki combination because the Bowker/Tamori/Sasaki Mitsuyuki combination fails to teach a portable key unit comprising a sensor and a semiconductor memory device, but not a processor.

In rejecting claims 43 and 44 for obviousness, the Examiner contends that the Bowker/Tamori combination teaches all limitations of claims 43 and 44 except for the specific distribution of components recited in claims 43 and 44. The Office Action cites the Sasaki Mitsuyuki reference (JP 05263558) for teaching this missing limitation when it states:

> Sasaki discloses an IC card 1 carried by a person that makes entrance to and exit fro a specified area or building, identification information comprising fingerprint identifying the user of the building is stored in memory 1a and a sensor 1d that senses the fingerprint of the user is provided to the IC card (Fig. 1, Abstract). (See Office Action, page 24).

Applicant respectfully submits that the rejection is silent as to any teachings found in Sasaki Mitsuyuki with respect to the placement of a matching processor. As such, Applicant respectfully submits that the obviousness rejection is deficient because the Office Action fails to set forth how the cited references teach or suggest each element of the rejected claims. Withdrawal of the obviousness rejection of claims 43 and 44 is respectfully requested.

NEW MATTER OBJECTIONS (AND RELATED CLAIM REJECTIONS):

The Office Action objects to the entry of Figures 30(c), 30(d), and 30(f), contending that the addition of these figures to the application constitutes illegal new matter. While Applicant has canceled Figure 30(f) and Figure 47 from the application by this response, Applicant respectfully submits that the new matter objection entered against these figures is nevertheless incorrect. However, since claims directed to that embodiment are not currently being pursued in this application, the new matter issue has been rendered moot.

As to Figure 30(c), the Office Action's contention that it depicts new matter is incorrect. Support for Figure 30(c) is clearly set forth in the application at page 51, lines 14-19. This figure is also amply supported by page 51, line 25 through page 52, line 1. These passages must be read in their context as they would be understood by a person of ordinary skill in the art. Page 51, lines 14-19 clearly set forth Figure 30(c)'s allocation of the encoding, matching,

and registering programs. Further, the fact that the lines 14-19 sentences describe a modification relative to Figure 30(b) (meaning that the EEPROM 14 need not be included on the card K) is clear from its context. For example, page 51, lines 27-29 note that the data receiving side can transmit registered fingerprint codes to the card K for matching. From this, it is clear that the EEPROM 14 would not need to be on the card K as noted at page 51, lines 13-14.

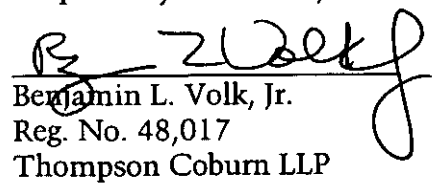
As to Figure 30(d), the allocation of the encoding program to the receiving side is described to a person of ordinary skill in the art, wherein the application teaches that the sensor can be located on the data receiving side. A person of ordinary skill in the art would understand that is it preferable to couple the sensor with the encoding program. This is apparent from Figures 30(a), (b), (c), and (e) which disclose the sensor and encoding program co-located. Thus, Figure 30(d) does not appear unlike the other figures because in that figure, once the sensor moved to the receiving side as described in the specification, the encoding program followed, as would be understood by one of ordinary skill in the art.

Having shown that Figures 30(c) and 30(d) do not depict new matter, Applicant respectfully submits that the §112, paragraph one, rejections found in the application should be withdrawn.

Conclusion:

For the foregoing reasons, Applicant respectfully submits that the amended claims are patentable over the cited references and no new matter is present in the application. As to the Markush claims 11, 16, 19, and 22, Applicant submits that by virtue of each Markush group member being nonobvious over the cited references, the corresponding Markush claims are also nonobvious. Favorable action is respectfully requested.

Respectfully submitted,



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MARKED UP COPY OF AMENDED CLAIMS:
(additions underlined; deletions bracketed)

11. (thrice amended) A locking device comprising:

(a) a locking mechanism for locking and unlocking movement of an object;

(b) a pressure-based fingerprint sensor for detecting a fingerprint pattern comprising at least a portion of a plurality of ridges and a plurality of valleys of a finger in both an x-direction and a y-direction when said finger is pressed against said sensor;

(c) a semiconductor memory device for storing registered fingerprint data;

(d) a processor configured to determine by electronic processing whether the fingerprint data created from the fingerprint pattern detected by said fingerprint sensor matches with any of the registered fingerprint data stored in said semiconductor memory device;

(e) a control unit for controlling whether said locking mechanism locks or unlocks movement of said object in response to said fingerprint match determination by said processor; and

(f) a [portable] key unit separated from said locking mechanism and independently portable with respect to said control unit and said locking mechanism, said portable key unit comprising one of the group consisting of: (1) said sensor, said semiconductor memory device, and said processor but not said control unit, and wherein said portable key unit is in communication with said control unit via wireless communication, (2) said sensor and said processor but not said semiconductor memory device and not said control unit, and wherein said portable key unit is in communication with said semiconductor memory device and said control unit via wireless communication, (3) said processor but not said sensor, not said semiconductor memory device, and not said control unit, and wherein said portable key unit is in communication with said sensor, said semiconductor memory device, and said control unit via wireless communication, and (4) said sensor and said semiconductor memory device but not said processor and not said control unit, and wherein said portable key unit is in communication with said processor and said control unit

via wireless communication[, and (5) said semiconductor memory device, but not said sensor, not said processor, and not said control unit].

12. (thrice amended) The locking device of claim 11 wherein said portable key unit comprises said sensor, said processor, and said semiconductor memory device but not said control unit, and wherein said portable key unit is in communication with said control unit via wireless communication.

13. (twice amended) The locking device of claim 12 wherein said portable key unit is configured to wirelessly communicate with said control unit via [(1) at least one electrical connector, (2) wireless communication, (3)] magnetic coupling[, or (4) electrostatic coupling].

15. (thrice amended) The locking device of claim 11 wherein said portable key unit comprises said processor but not said sensor, not said semiconductor memory device, and not said control unit, and wherein said portable key unit is in communication with said sensor, said semiconductor memory device, and said control unit via wireless communication.

16. (thrice amended) A locking device comprising:

(a) a locking mechanism for locking and unlocking movement of an object;

(b) a pressure-based fingerprint sensor for detecting a fingerprint pattern comprising at least a portion of a plurality of ridges and a plurality of valleys of a finger in both an x-direction and a y-direction when said finger is pressed against said sensor;

(c) a semiconductor memory device for storing registered fingerprint data;

(d) a first processor configured to determine by electronic processing whether the fingerprint data created from the fingerprint pattern detected by said fingerprint sensor matches with any of the registered fingerprint data stored in said semiconductor memory device;

(e) a second processor in communication with said first processor and said semiconductor memory device, said second processor being configured to (1) create fingerprint data from the fingerprint pattern of an authorized person detected by said fingerprint sensor and (2) register said [an] authorized person by storing said created

fingerprint data in said semiconductor memory device [fingerprint data created from said fingerprint pattern of said authorized person and detected by said sensor];

(f) a control unit for controlling whether said locking mechanism locks or unlocks movement of said object in response to said fingerprint match determination by said processor; and

(g) a [portable] key unit separated from said locking mechanism and independently portable with respect to said control unit and said locking mechanism, said portable key unit comprising either (i) said first processor [and said sensor] but not said second processor, wherein said portable key unit is configured to wirelessly communicate with said control unit and said second processor, or (ii) said second processor [and said sensor] but not said first processor, wherein said portable key unit is configured to wirelessly communicate with said first processor.

17. (thrice amended) The locking device of claim 11 wherein said portable key unit comprises said sensor and said processor but not said semiconductor memory device and not said control unit, and wherein said portable key unit is in communication with said semiconductor memory device and said control unit via wireless communication.

19. (thrice amended) A switching device comprising:

(a) a starting switch for starting operation of an object;

(b) a pressure-based fingerprint sensor for detecting a fingerprint pattern comprising at least a portion of a plurality of ridges and a plurality of valleys of a finger in both an x-direction and a y-direction when said finger is pressed against said sensor;

(c) a semiconductor memory device for storing registered fingerprint data;

(d) a processor configured to (1) determine by electronic processing whether the fingerprint data created from the fingerprint pattern detected by said sensor matched with any of the registered fingerprint data stored in said semiconductor memory device and (2) actuate said starting switch in response to said fingerprint match determination being positive; and

(e) a [portable] key unit separated from and independently portable with respect to said starting switch, said portable key unit comprising one selected from the group

consisting of: (1) said sensor, said semiconductor memory device, and said processor, and wherein said portable key unit is configured to communicate with said starting switch via wireless communication, (2) said sensor and said processor but not said semiconductor memory device, and wherein said portable key unit is configured to communicate with said seminconductor memory device and said starting switch via wireless communication, (3) said processor but not said sensor and not said semiconductor memory device, and wherein said portable key unit is configured to communicate with said sensor, said semiconductor memory device, and said starting switch via wireless communication, and (4) said sensor and said semiconductor memory device but not said processor, and wherein said portable key unit is configured to communicate with said processor via wireless communication[, and (5) said semiconductor memory device, but not said sensor and not said processor].

20. CANCELED

21. (thrice amended) The switching device of claim 19 wherein said portable key unit comprises said sensor and said processor but not said semiconductor memory device, and wherein said portable key unit is configured to communicate with said seminconductor memory device and said starting switch via wireless communication.

22. (twice amended) A switching device comprising:

(a) a starting switch for starting operation of an object;

(b) a pressure-based fingerprint sensor for detecting a fingerprint pattern comprising at least a portion of a plurality of ridges and a plurality of valleys of a finger in both an x-direction and a y-direction when said finger is pressed against said sensor;

(c) a semiconductor memory device for storing registered fingerprint data;

(d) a first processor configured to (1) determine by electronic processing whether the fingerprint data created from the fingerprint pattern detected by said sensor matched with any of the registered fingerprint data stored in said semiconductor memory device and (2) actuate said starting switch in response to said fingerprint match determination being positive;

(e) a second processor in communication with said first processor and said semiconductor memory device, said second processor being configured to (1) create fingerprint data from the fingerprint pattern of an authorized person detected by said fingerprint sensor and (2) register said [an] authorized person by storing said created fingerprint data in said semiconductor memory device [fingerprint data created from said fingerprint pattern of said authorized person and detected by said sensor]; and

(f) a portable key unit separated from said starting switch and independently portable with respect to said starting switch, said portable key unit comprising either (i) said first processor [and said sensor] but not said second processor, wherein said portable key unit is configured to wirelessly communicate with said control unit and said second processor, or (ii) said second processor [and said sensor] but not said first processor, wherein said portable key unit is configured to wirelessly communicate with said first processor.

23. (twice amended) The switching device of claim 31 wherein said portable key unit is configured to wirelessly communicate with said starting switch via [(1) at least one electrical connector, (2) wireless communication, (3)] magnetic coupling[, or (4) electrostatic coupling].

31. (twice amended) The switching device of claim 19 wherein said portable key unit comprises said sensor, said semiconductor memory device, and said processor, and wherein said portable key unit is configured to communicate with said starting switch via wireless communication.

42. CANCELED

43. (amended) The locking device of claim 11 wherein said portable key unit comprises said sensor and said semiconductor memory device, but not said processor and not said control unit, and wherein said portable key unit is in communication with said processor and said control unit via wireless communication.

44. (amended) The switching device of claim 19 wherein said portable key unit comprises said sensor and said semiconductor memory device but not said processor, and wherein said portable key unit is configured to communicate with said processor via wireless communication.

45. (amended) The switching device of claim 19 wherein said portable key unit comprises said processor but not said sensor and not said semiconductor memory device, and wherein said portable key unit is configured to communicate with said sensor, said semiconductor memory device, and said starting switch via wireless communication.

46. (amended) The locking device of claim 16 wherein said portable key unit comprises said first processor [and said sensor] but not said second processor, wherein said portable key unit is configured to wirelessly communicate with said control unit and said second processor.

47. (amended) The locking device of claim 16 wherein said portable key unit comprises said second processor [and said sensor] but not said first processor, wherein said portable key unit is configured to wirelessly communicate with said first processor.

48. (amended) The switching device of claim 22 wherein said portable key unit comprises said first processor [and said sensor] but not said second processor, wherein said portable key unit is configured to wirelessly communicate with said control unit and said second processor.

49. (amended) The switching device of claim 22 wherein said portable key unit comprises said second processor [and said sensor] but not said first processor, wherein said portable key unit is configured to wirelessly communicate with said first processor.

MARKED-UP COPY OF AMENDED SPECIFICATION PARAGRAPH ON PAGE 9 EXTENDING FROM LINES 20-21;

(additions underlined; deletions bracketed)

Figures 30(a)-(e) [(f)] depict diagrams showing various alternative structures for the lock depicted in Figure 29.

MARKED-UP COPY OF THE SPECIFICATION PARAGRAPH ON PAGE 10 APPEARING AT THE END OF THE "BRIEF DESCRIPTION OF THE INVENTION" SECTION;

(additions underlined; deletions bracketed)

[Figure 47 depicts a diagram showing multiple matching circuits performing fingerprint match determinations in parallel.]